Name: Date:

Polynomial Factoring solution (version 25)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 54 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(54)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 216}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-72}}{2}$$

$$x = \frac{12 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{12 \pm 6\sqrt{2}\, i}{2}$$

$$x = 6 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 + 2i$ and $3 - 4i$ in standard form $(a + bi)$.**

Solution

$$(9 + 2i) \cdot (3 - 4i)$$

$$27 - 36i + 6i - 8i^2$$

$$27 - 36i + 6i + 8$$

$$27 + 8 - 36i + 6i$$

$$35 - 30i$$

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3. **Write function $f(x) = x^3 - x^2 - 14x + 24$ in factored form. I'll give you a hint: one factor is $(x - 2)$.**

Solution

	1	-1	-14	24
2		2	2	-24
	1	1	-12	0

$$f(x) = (x-2)(x^2 + x - 12)$$

$$f(x) = (x-2)(x+4)(x-3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+4) \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.